

REMARKS

Claims 1-39 are pending in the subject application. In the outstanding Office Action, the Examiner rejects claims 1-4, 6, 13 and 15 under 35 U.S.C. § 102(e) as being anticipated by U.S. 2003/0209166 by Vanmaele et al. (Vanmaele). The Examiner also rejects claims 8-11, 14-17, 24 and 30-39 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,135,569 to Mathias (Mathias) in view of Vanmaele. Similarly, the Examiner rejects claims 5, 7, 12, 18-23 and 25-29 under 35 U.S.C. § 103(a) as being unpatentable over Vanmaele.

Thus, of the four independent claims in the subject application, claims 1, 13, 18 and 25, the Examiner rejects claims 1 and 13 as being anticipated by Vanmaele and claims 18 and 25 as being obvious in view of Vanmaele.

The foregoing rejections are respectfully disagreed with, and are traversed below.

It is asserted that the cited references do not disclose or suggest the subject claims for at least the following reasons. Vanmaele discloses an ink composition containing a particular type of dye $(\text{DYE})_n(\text{SAU})_m$ that is capable of self assembly or is capable of assembly with another analogous dye $(\text{DYE}')_n(\text{SAU}')_m$ or is capable of assembling with a compound $(\text{SAU}'')_p(\text{X})_q$. (SAU) is defined as a multiple H-donor/accepting residue, which can form at least three hydrogen bonds and is capable of assembling under appropriate conditions (See paragraph [0034]). As is known to those skilled in the art and as indicated in Vanmaele, this type of residue must have both H-donor sites and H-acceptor sites as a prerequisite for self-assembly (i.e., it must be capable of multiple intermolecular hydrogen bonding).

For self-assembling properties, (SAU) groups contain a hydrogen donor and a hydrogen acceptor (carbonyl or imino group) and these groups should be conjugated directly to each other to give the requisite 120° bond angles for stable multiple hydrogen bonding. Such functional groups are found in amides, ureas, carbamates, aminotriazines, aminobarbiturate, etc. and may generally referred to as amidic groups.

The nitrogen atoms in such amidic species are very weakly basic and are incapable of protonation in dilute acids to give cationic ammonium salts. If protonation is forced by use of concentrated acids, the resultant cations are unstable and dissociate spontaneously on dilution with water. Thus, they do not give water soluble salts by protonation with acids. By convention, amidic groups are not regarded as true amino groups. True amino groups do protonate easily in dilute acids to give stable water soluble ammonium salts. It should be noted that the examples of (SAU) residues given in Vanmaele contain such weakly basic amidic groups to provide the required self-assembling characteristics.

In contrast to Vanmaele, independent claim 1 of the subject application defines the claimed novel colorant as “comprising an organic dye chromophore with at least one functional group Y containing one or more primary, secondary or tertiary amino groups, which in the presence of an acid provides a water soluble, cationic ink jet ink colorant...” (emphasis added). Independent claim 13 similarly defines the colorant claimed therein, with the addition of linking group X. The foregoing indicates that Y contains only true amino functionality and not amidic functionality. One skilled in the art would recognize that such Y groups because of their high basicity and amino functionality would be incapable of self assembly.

Thus, Vanmaele does not disclose or even suggest Applicant’s colorant of independent claims 1 and 13. In contrast, Vanmaele teaches away from the subject claims, as described above. This is further evident by claims 5-7 of the subject application, which sets forth basic amino groups only, and none have adjacent carbonyl or imino groups that would render them amidic and therefore capable of self-assembly.

Independent claim 18 of the subject application claims Applicant’s novel colorant “comprising an organic dye chromophore having at least two positive charges provided by one or more attached functional groups, Q, each containing one or more cationic quaternary ammonium groups...” Independent claim 25 of the subject application also requires such features. It is well known to those skilled in the art that

quaternary ammonium groups are incapable of self-assembly because they are incapable of taking part in hydrogen bonding (they do not have any hydrogen atoms attached to nitrogen to provide the requisite hydrogen bond). Thus, for at least the foregoing reasons, Vanamaele does not disclose or suggest the claimed colorant.

As independent claims 1, 13, 18 and 25 are believed to be patentable, remaining claims 2-12, 14-17, 19-24 and 26-39 depending directly or indirectly from an independent claim are also believed to be patentable in view of their dependency from a patentable independent claim. However, for completeness, the Mathias reference cited by the Examiner in rejecting dependent claims 8-11, 14-17, 24 and 30-39 will also be addressed.

It is asserted that the addition of Mathias does not cure the shortcomings of Vanamaele for at least the following reasons. Mathias does not describe black fluorescent inks or water based fluorescent inks, as claimed herein. Mathias merely describes a solvent based ink containing a black dye and a fluorescent dye. The role of the solvent is to impregnate the surface of the media or article in order to achieve indelibility after removing the black dye, in further contrast to the subject claims. For example, in claim 9, Applicant claims a certain level of luminescent signal in the ink itself without any media interference.

Moreover, claims 31-37 of the subject application describe a water base system as a main solvent in further contrast to Mathias, which does not relate to water based inks at all.

In view of the foregoing, the Examiner is kindly requested to reconsider and remove the outstanding rejections based upon Vanamaele and Mathias.

All issues having been addressed, the subject application is believed to be in condition for immediate allowance. Accordingly, an early notification of the allowance of claims 1-39 is earnestly solicited.

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